

MATERIAL SAFETY DATA SHEET

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Version 1.11

Section 1 - Product and Company Information

Product Name	DIETHYL ETHER, >=98%, A.C.S. REAGENT, CONTAINS ETHANOL, STABILIZED W/BHT (POLY-COAT)
Product Number	472492
Brand	SIAL
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
DIETHYL ETHER, STABILIZED WITH ETHANOL	60-29-7	No

Ingredient Name	CAS #	Percent	SARA 313
Stabilized with:	None		
ETHYL ALCOHOL, NON-DENATURED, 200 PROOF	64-17-5	>= 1 <= 2	No

Formula	C4H10O
Synonyms	Aether * Anaesthetic ether * Anesthesia ether * Anesthetic ether * Diaethylaether (German) * Diethyl ether (DOT:OSHA) * Diethyl oxide * Dwuetylowy eter (Polish) * Etere etilico (Italian) * Ether * Ether ethylique (French) * Ethoxyethane * Ethyl ether (ACGIH:OSHA) * Oxyde d'ethyle (French) * RCRA waste number U117 * Solvent ether
RTECS Number:	KI5775000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Extremely Flammable (EU). Harmful.
Harmful if swallowed. May form explosive peroxides. Irritating to eyes, respiratory system and skin. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.
Target organ(s): Central nervous system. Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 4
REACTIVITY: 3

NFPA RATING

HEALTH: 2
FLAMMABILITY: 4
REACTIVITY: 3

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes
Peroxide Former: Yes

EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT

- 40.0 °F - 40.0 °C Method: closed cup

EXPLOSION LIMITS

Lower: 1.8 % Upper: 48 %

AUTOIGNITION TEMP

160 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed. Keep away from heat, sparks, and open flame. Store under nitrogen.

SPECIAL REQUIREMENTS

Store under inert gas. Light sensitive. Air sensitive. Heat sensitive. Do not distill to dryness. Refrigerate before opening.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	500 PPM
USA	ACGIH	TWA	400 PPM
USA	MSHA Standard-air	TWA	400 PPM (1200 MG/M3)
USA	OSHA.	PEL	8H TWA 400 PPM (1200 MG/M3)
New Zealand	OEL		
Remarks: check ACGIH TLV			

EXPOSURE LIMITS

Country	Source	Type	Value
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Poland	NDS	300
Poland	NDSch	600
Poland	NDSP	-

Section 9 - Physical/Chemical Properties

Appearance Physical State: Liquid
Color: Colorless

Property	Value	At Temperature or Pressure
Molecular Weight	74.12 AMU	
pH	N/A	
BP/BP Range	34.6 °C	760 mmHg
MP/MP Range	- 116.0 °C	
Freezing Point	N/A	
Vapor Pressure	442.552 mmHg	20 °C
Vapor Density	2.6 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.71 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	- 40.0 °F - 40.0 °C	Method: closed cup
Explosion Limits	Lower: 1.8 % Upper: 48 %	
Flammability	N/A	
Autoignition Temp	160 °C	
Refractive Index	1.353	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: May form peroxides of unknown stability.

Conditions to Avoid: Light. Heat. Air.

Materials to Avoid: Oxidizing agents, Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: Harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Skeletal muscle. G.I. System. Liver. Kidneys. Central nervous system.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Drowsiness. Dizziness. Contact with eyes can cause redness, tearing, and blurred vision. Prolonged or repeated contact with skin can cause defatting and dermatitis. Exposure can cause: Coughing, chest pains, difficulty in breathing.

TOXICITY DATA

Oral
Man
260 mg/kg
LDLO

Oral
Rat
1215 mg/kg
LD50

Inhalation
Mouse
31,000 ppm
LC50

Remarks: Behavioral:Convulsions or effect on seizure threshold.

Intraperitoneal
Mouse
2420 MG/KG
LD50

Intravenous
Mouse
996 MG/KG
LD50

Skin
Rabbit
>20 ML/KG
LD50

IRRITATION DATA

Eyes
Human
100 ppm

Skin
Rabbit
360 mg
Remarks: Open irritation test

Eyes
Rabbit
100 mg
Remarks: Moderate irritation effect

Skin
Guinea pig
50 mg
24H
Remarks: Severe irritation effect

CHRONIC EXPOSURE - MUTAGEN

Species: Mouse
Dose: 2850 MG/L
Cell Type: Embryo
Mutation test: DNA inhibition

Species: Hamster
Dose: 1 PPH
Cell Type: fibroblast
Mutation test: Other mutation test systems

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Diethyl ether [or] Ethyl ether
UN#: 1155
Class: 3
Packing Group: Packing Group I
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: ETHYL ETHER
IATA UN Number: 1155
Hazard Class: 3
Packing Group: I

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F+-Xn
Indication of Danger: Extremely Flammable. Harmful.
R: 12-19-22-66-67
Risk Statements: Extremely flammable. May form explosive peroxides. Harmful if swallowed. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.

S: 9-16-29-33

Safety Statements: Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Extremely Flammable (EU). Harmful.

Risk Statements: Harmful if swallowed. May form explosive peroxides. Irritating to eyes, respiratory system and skin. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.

Safety Statements: Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Do not empty into drains. Take precautionary measures against static discharges.

US Statements: Target organ(s): Central nervous system. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.